

What is claimed is:

1. A method for processing fibre channel frames,
comprising:
 - 5 assigning a virtual lane for a frame based on a
hop count for the frame;
determining if the assigned virtual lane has
available credit; and
transmitting the frame if credit is available.
- 10 2. The method of Claim 1, further comprising:
incrementing a counter value for counting available
credit for the assigned virtual lane, if the frame is
sent using the assigned virtual lane.
- 15 3. The method of Claim 1, where the assigned virtual
lane has a programmed maximum credit count.
4. The method of Claim 1, where if all credit for the
assigned virtual lane has been used, then a next
virtual lane is selected with non-zero credit.
- 20 5. A method for processing fibre channel frames using
a fabric switch element having a receive port and a
transmit port, comprising:
 - assigning a virtual lane in the receive port based
on a hop count for the frame; and
sending a primitive to a transmit port with the
25 assigned virtual lane.

6. The method of Claim 5, further comprising:
 assigning a virtual lane on the transmit port
 based on the hop count of the frame; and
 determining if credit is available for the
5 assigned virtual lane to send the frame.
7. The method of Claim 6, where a credit count for
the assigned virtual lane is maintained by a counter
and the assigned virtual lane has a maximum credit
count.
- 10 8. The method of Claim 5, where a counter value is
decremented after the primitive is received by the
transmit port.
9. The method of Claim 5, where the hop count of the
frame is determined using D_ID of the frame.
- 15 10. The method of Claim 6, where the assigned virtual
lane value at the transmit port is less than the
assigned virtual lane in the receive port.
11. A system for processing fibre channel frames,
comprising:
- 20 a fibre channel fabric switch element including a
receive port for receiving fibre channel frames,
which includes a look up table to assign a virtual
lane based on a hop count of the frame; and a
transmit port that receives a primitive with the
25 assigned virtual lane by the receive port and the

transmit port includes a credit control module that determines if an assigned virtual lane can transmit a frame based on available credit.

12.The system of Claim 11, where the credit control
5 module increments a credit count for an assigned virtual lane if a frame has been transmitted from the assigned virtual lane.

13.The system of Claim 11, where the credit control
10 module decrements a credit count for an assigned virtual lane if a VC_RDY is received.

14.The system of Claim 11, where the credit control module maintains a maximum count for every virtual lane used for transmitting frames.

15.The system of Claim 12, where the credit control
15 module uses an increment selector to increment credit count.

16.The system of Claim 13, where the credit control module uses a decrement selector to decrease the credit count.

17.The system of Claim 11, where the credit control
20 module uses compare logic to compare available credit for an assigned virtual lane at any given time with a programmed maximum credit value for the assigned virtual lane.

18.A fibre channel fabric switch element for processing fibre channel frames, comprising:

5 a receive port for receiving fibre channel frames, which includes a look up table to assign a virtual lane based on a hop count of the frame;

and a transmit port that receives a primitive with the assigned virtual lane by the receive port and the transmit port includes a credit control module that determines if an assigned virtual lane can transmit a frame based on available credit.

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19.The switch element of Claim 18, where the credit control module increments a credit count for an assigned virtual lane if a frame has been transmitted from the assigned virtual lane.

15 20.The switch element of Claim 18, where the credit control module decrements a credit count for an assigned virtual lane if a VC_RDY is received.

21.The switch element of Claim 18, where the credit control module maintains a maximum count for every virtual lane used for transmitting frames.

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22.The switch element of Claim 19, where the credit control module uses an increment selector to increment credit count.

23.The switch element of Claim 20, where the credit control module uses a decrement selector to decrease the credit count.

24.The switch element of Claim 18, where the credit control module uses compare logic to compare
5 available credit for an assigned virtual lane at any given time with a programmed maximum credit value for the assigned virtual lane.

25.A system for processing fibre channel frames,
10 comprising:

means for assigning dedicated virtual lanes for transmitting frames, where the virtual lanes are assigned based on a hop count of a frame;

means for maintaining a credit count for each
15 virtual lane used for transmitting frames; and

means for determining if credit is available for a particular virtual lane that is assigned based on the hop count.

26.The system of Claim 25, further comprising:

20 means for maintaining a maximum credit count for each virtual lane; and

means for comparing the maximum credit count with the credit available for a virtual lane at any given time.

27.A fibre channel fabric switch element for
processing fibre channel frames, comprising:

means for assigning dedicated virtual lanes for
transmitting frames, where the virtual lanes are
5 assigned based on a hop count of a frame;
means for maintaining a credit count for each
virtual lane used for transmitting frames; and
means for determining if credit is available for a
particular virtual lane that is assigned based on the
10 hop count.

28.The switch element of Claim 27, further
comprising:

means for maintaining a maximum credit count for
each virtual lane; and
15 means for comparing the maximum credit count with
the credit available for a virtual lane at any given
time.